New Haven Land Trust
New Haven Coastal Climate Resilience
Work Plan

I. Project Title and Project Purpose Statement

The New Haven Land Trust's "New Haven Coastal Climate Resilience" grant application is a Community Climate Resiliency proposal that will create a land preservation and climate change resilience initiative focused on sea level rise mitigation and adaptation in New Haven, Connecticut (zip codes: 06510, 06511, 06513, 06515, 06519). The grant proposal includes activities covered under the Clean Water Act, Section 104(b)(3) (principally "wetlands protection" and "coastal and estuarine planning").

In recent years, storm and other weather events have underscored the urgency of climate change preparedness for coastal urban centers. Economically challenged urban centers like New Haven are in particular need given the large residential population living at or slightly above sea level with little financial or other resources to respond to climate change.

As a community-based land preservation organization with four coastal nature preserves, the New Haven Land Trust is poised to play a key role in improving New Haven's ability to defend itself from the negative impacts of sea level rise and extreme climate events and to advance the community conversation with regards to climate change resiliency. The New Haven Land Trust will be the lead organization involved in this grant, however numerous partners with which we have both new and ongoing relationships will work with us to implement various portions of the grant.

The Land Trust's New Haven Coastal Climate Resilience grant proposal's goal is threefold: 1. Expand the size of existing coastal nature preserves through land acquisition to facilitate more public access to open space and to improve the buffering ability of coastal wetland due to ocean migration; 2. Conduct environmental outreach to raise awareness of environmental issues with special focus on the impacts of climate change and the importance of community-based resilience in the face of climate change; 3. Steward and strengthen existing nature preserves to ensure quality ecosystems that foster public access, education and biodiversity. These three approaches operated in tandem will lead to increased public education around the impacts of climate change and permanently preserve certain marshland for long-term resilience in the face of sea level rise.

II. Environmental, Public Health and Community Climate Resiliency Information

Connecticut urban centers have historically been among the most negatively impacted environmentally and, among Connecticut urban centers, New Haven has been disproportionately impacted. As an urban community facing many economic, health and environmental challenges, New Haven is an "affected community" in every sense of the word. As a coastal urban center New Haven also confronts disproportionate potential impacts from a changing climate.

New Haven communities face significant health and environmental challenges. Of the city's population of 130,741, seven in ten people are overweight or obese and 15% report as

diabetic as compared to 6% nationally.[1] New Haven has the highest rate of asthma-related hospitalizations in the state[2] resulting from two interstate highways passing through the city center and an active nautical port, high child blood lead levels resulting from industrial-era housing and soil pollutants, and high heart disease and diabetes rates due to a lack of access to fresh produce and a lack of open space for exercise and outdoor recreational use.

In addition to the impacts of air and water pollutants, New Haven is also at risk from a climate change perspective. The City was ranked eighth of Connecticut municipalities with the largest exposed population to the impacts of sea level rise and was the only large urban city.[3] A significant portion of the City's population is located at or near sea level elevation as is critical city infrastructure such as schools, public utilities and public housing. As stated in the City of New Haven's Hazard Mitigation Report, coastal areas in the city are at high risk to be heavily impacted by sea level rise. Neighborhoods highlighted as at risk in the report, Quinnipiac Meadows and the East Shore, abut several of our nature preserves mentioned in this grant proposal.

New Haven's poverty level is high. Preoccupied by urgent issues created by poverty, crime and economic crises, City government has not played a leadership role in addressing climate change. Likewise, communities themselves are widely not cognizant of or able to advocate for climate resiliency efforts. While on occasion media reports raise the concern of the potential negative impacts of climate change on New Haven, there has yet to be any organized effort to prepare the city for the impact of future sea level rise or storm events.

The Land Trust is already addressing many of these issues by providing access to 80 acres of open space and the opportunity for over 800 residents to grow their own vegetables. The Land Trust is also in a position to play an important role in an effort to prepare for the impacts of climate change. This is particularly so given the environmental justice aspects of open space preservation. The preservation of additional open space will result both in public health benefits associated with open space access and the climate resiliency benefits associated with coastal wetlands. This "New Haven Coastal Climate Resilience" grant will assist to jump start such an initiative.

III. Organization's Historical Connection to the Affected Community

The New Haven Land Trust is a 501(c) (3) non-profit organization based in New Haven, Connecticut that manages six nature preserves and 46 community gardens, all within New Haven city limits. The Land Trust's 33 year history and network of open spaces and community gardens has allowed for the organization to grow deep roots in communities throughout the city and become a trusted source of support and information regarding environmental issues.

1"Publications & Reports." *CARE: Community Alliance for Research and Engagement*. Web. 8 Jan. 2015. <http://care.yale.edu/resources/reports.aspx#page4>.

2"Report: CT Asthma Rate Higher Than U.S." *Hartford Courant*. 6 Dec. 2012. Web. 8 Jan. 2015. <http://articles.courant.com/2012-12-06/health/hc-asthma-in-ct-1207-20121206_1_asthma-program-asthma-rates-connecticut-children>.

3"Report: Facts and Findings: Sea Level Rise and Storm Surge Threats for Connecticut" *Climate Central*. 14 Mar. 2012. Web. 8 Jan. 2015. <http://slr.s3.amazonaws.com/factsheets/Connecticut.pdf>.

Nature Preserves: The Land Trust's six nature preserves are located primarily on coastal areas abutting the Long Island Sound and mouth of the Quinnipiac River. The preserves abut urban neighborhoods and provide opportunities for access to open space and recreation for many New Haven residents living near the preserves. The Land Trust manages the preserves with input from a committee of private residents that volunteer to share their thoughts and expertise. By meeting with this committee and by inquiring from attendees at events, the Land Trust is able to receive input about the preserves from the wider community. In fact, it is through this committee's input that proposals such as this one are born. Several of our preserves have walking paths that traverse marsh, woodland, mudflat and beach habitats. Residents from other neighborhoods in New Haven and outside the city also frequent our nature preserves to enjoy the ecosystem that our preserves maintain.

Environmental Education: In addition to hosting frequent unguided visitors to our preserves, the Land Trust offers limited educational programming for community members. Recent educational events have included a live bird show and bird walk hosted jointly with Audubon Connecticut, canoe and kayak guided tours, and a bioblitz community species inventory event, to name a few. In order to steward the preserves the Land Trust also hosts monthly community workdays. Workday projects have included invasive species removal, native tree planting, trail work, and litter cleanup. These educational and volunteer opportunities engage residents to understand the importance of preserving our local resources.

Community Gardening: While not the primary focus of this grant, it is important to underscore the Land Trust's second core mission – maintaining 46 community gardens that are scattered throughout the city but concentrated in low-resource neighborhoods experiencing severe economic blight and hardship. The gardens provide residents the opportunity to grow healthy organic food at no cost. More importantly for the purposes of this grant application, the gardens have created a relationship of trust between the Land Trust and community members and an opportunity for the Land Trust to implement environmental educational programming that reaches beyond the traditional channels of outreach. Currently the Land Trust offers educational programming primarily related to urban agriculture. This grant would allow the Land Trust to expand this educational programming to include information on climate change, sea level rise and environmental stewardship.

Partnerships: The Land Trust's long history has enabled us to develop strong relationships with many regional partners in environmental and urban agricultural issues. We have worked closely with our partners on joint projects that span from jointly run garden and preserve educational programs, to a fiscal partnership spearheaded by the Land Trust to create an urban agriculture resource center, to a large-scale dam removal project to improve fish migration. Partners are critical to our day to day success and important to the success of this grant.

The Land Trust is a in a key position as a trusted organization with a strong history in New Haven to increase community awareness and engagement in issues surrounding climate change and climate resiliency.

IV. Project Description

Project Background and Description of Need: The Land Trust owns and manages six nature preserves for a total of 80 acres of property. The focus of the grant proposal, (activities covered

under the Clean Water Act, Section 104(b)(3)) is on four of the Land Trust's nature preserves that are located on coastal areas along the Long Island Sound and the mouth of the Quinnipiac River. While the total amount of land managed by the Land Trust is not large, the properties are particularly valuable from environmental justice, sea level rise adaptation and ecosystem services perspectives.

Environmental Justice: Open space is limited and critically important to New Haven. New Haven residents have little opportunity to access open space for walking, jogging, biking, and other forms of outdoor recreation. While abutting towns have more funding and land available to preserve as open space, New Haven's history as an industrial city creates the challenges of limited existing land in addition to soil and environmental pollutants that restrict the ability to acquire land and open it up to the public. The New Haven Land Trust's preserves offer critical green space for public enjoyment and education.

Sea Level Rise Adaptation: Tidal marshes play a critical role in mitigating the dramatic impacts that severe storm events produced through climate change and intensified by sea level rise can have on shoreline properties and infrastructure. Historically, salt marshes have been able to keep pace with sea level rise through accretion and marsh migration. In Connecticut, both of these processes are especially constrained. The Connecticut shoreline is one of the most densely populated parts of the country, and the remaining wetlands are highly restricted by human development, Interstate 95 and the railroad, all of which present clear physical barriers to the inland migration of the marsh. As such, remaining coastal open space that is able to facilitate tidal marsh migration is critical to mitigate the impacts of sea level rise. Four Land Trust Nature Preserves located on coastal sites currently are in a position to facilitate marsh migration. Abutting private open space that the Land Trust wishes to acquire will increase this potential.

Ecosystem Services: Equally important, as a coastal city, New Haven's remaining open spaces serve as a vital ecosystem for many species that are threatened. The limited open space available in New Haven serves as a major migratory bird resting space, a spawning ground for migratory fish such as the alewife and a safe harbor for species regaining a foothold in urban areas such as coyote. On the coastal tidal marshes our preserves host a variety of fish, crustaceans, terrapins/turtles, birds, and so on.

The need in New Haven for environmental protection and education is clear. The New Haven Land Trust is in a unique position to address many of the environmental challenges due to its relationship and reputation in the New Haven community, land ownership and its capacity. An EPA Environmental Justice Grant will allow the New Haven Land Trust to broaden its impact and significantly increase its ability to affect change through direct programming.

Detailed Project Proposal:

The Environmental Justice Climate Grant project is three-fold, Land Acquisition, Climate Change Education and Land Stewardship. Details of each portion of the project are laid out below:

A. Land Acquisition:

Background: Of the coastal preserves that the Land Trust operates three of four abut private property that remains undeveloped or underdeveloped. These properties are critical to preserve

because they currently provide valuable ecosystem services as well as the potential to allow for the migration of sea level rise. Of the various impacts of climate change felt in Southern New England—increased rainfall, more frequent and intense storm events, warmer temperatures, and ocean acidification among them—sea level rise poses the most immediate threat to coastal wetlands, like those at the Land Trust's Long Wharf, Quinnipiac River, Hemmingway Creek and Morris Creek Nature Preserves. By increasing the amount of land under the Land Trust's management, there will be more areas conserved in perpetuity to mitigate the impacts of sea level rise, for residents to recreate and learn about the importance preserving these ecosystems, and for important plant and wildlife habitats.

Quinnipiac Meadows Preserve is a 35 acre preserve that includes Tidal Wetlands, Coastal Forest and Coastal Grasslands. The residential area next to the Preserve has been identified in the City of New Haven's Hazard Mitigation Plan as likely to experience significant impacts of sea level rise.[4] The New Haven Land Trust acquired the Preserve through three separate transactions: a 9 acre donation by the City of New Haven in 1986; a purchase of a 17 acre parcel from the Regional Water Authority in 1999; and the donation of 9 acres, Grannis Island, by a private resident in 2008. The Preserve is a diverse ecosystem of primarily native plant species, which are a haven for native species of birds, butterflies and other insects. The property is designated an Important Bird Area by Audubon Connecticut and includes a bird blind overlooking the salt marsh and river for bird watchers to observe migratory birdlife that frequents the preserve and several osprey platforms. Two loop trails offer the community the opportunity to experience the various ecosystems of the Preserve and sometimes see Diamond Back Terrapins that also inhabit the Preserve.

A federally funded environmental renovation project has been conducted over the past several years by Land Trust staff and volunteers to improve wildlife habitat by eradicating exotic invasive plants and replacing them with a diversity of native plants common to Connecticut coastal zones.

Abutting the preserve are three large privately owned properties – two of which are undeveloped and one currently used as a construction staging ground. Over time the construction staging ground has filled in portions of the abutting wetland. Acquisition of these properties would dramatically increase the size of the preserved land as well as the allowable land for coastal migration. The Land Trust has held preliminary conversations with abutters about acquiring these properties. Additional potential exists with other partially developed properties abutting the preserve for the creation of conservation easements to ensure limited development.

Hemmingway Creek Preserve abuts the Quinnipiac Meadows Preserve and currently is primarily an inland wetland ecosystem. Hemmingway Creek has been identified in the City of New Haven's Hazard Mitigation Plan as a flood prone area within the 100 year flood plane with a base elevation prone to coastal inundation. The parcels that currently make up the Hemmingway Creek Preserve have been donated to the Land Trust by the City of New Haven. Hemmingway Creek Preserve was also recently identified in a report provided to the Land Trust

4"Report: City of New Haven Hazard Mitigation Plan Update" *City of New Haven*. 15 Jun. 2011. Web. 8 Jan. 2015. <http://www.cityofnewhaven.com/cityplan/pdfs/HazardMitigation/Final%20Draft.pdf>.

from the State of Connecticut's Department of Energy and Environmental Protection as having potential to host marsh migration as a result of sea level rise.

The City of New Haven has expressed interest in donating an additional property to the Land Trust. While the City is an enthusiastic and willing partner, the Land Trust needs to implement due diligence on the property including a phase 1 environmental assessment, property survey and title search to ensure the property meets conservation requirements.

Morris Creek Preserve is a mix of approximately fifteen properties acquired by the Land Trust over many years that is just under ten acres of tidal marsh. The City of New Haven owns various small parcels intermingled with the Land Trust's properties that, combined, preserve an important coastal wetland. The City and the Land Trust are jointly working to create a public greenway abutting the wetland to open recreational and educational access to the public. However, there are numerous small parcels that are still in private hands. Acquiring these properties would complete the continuity of this preserve, facilitate the creation of the public greenway and improve the ability of this area to mitigate the impacts of severe storm events intensified by sea level rise.

Acquisition Need: Property acquisition requires resources which the Land Trust currently does not have – staffing time to negotiate with property owners, manage relationships with our partner organizations such as the Connecticut Trust for Public Land and the City of New Haven, oversee environmental assessments, title searches and surveys, and so on. Currently the Land Trust has very limited staffing time and as such, we have been unable to move any of the above acquisition projects forward. It is important to underscore that the above acquisition projects all have different timelines. Some, such as the acquisition of the Hemmingway Creek property, we are confident can be completed in their entirety under the timeline of this grant. We are aware that others may take resources beyond the timeline of this proposal. However, there are critical steps that will be made as a part of this proposal to move these property acquisitions forward.

Leveraging Funds: The State of Connecticut currently offers a significant amount of grant funding designated for the purchase of open space land for Land Trusts. The available funding would dramatically increase our ability to offer a competitive price to purchase land from property owners for permanent preservation. While not guaranteed, this pool of funding is generally considered highly available for properties in urban centers that are impacted by poverty such as New Haven's. In other words, the properties that Land Trust is interested in acquiring closely fit the requirements of the state's Open Spaces funding and as such, likelihood of receiving the funding is high. Unfortunately, the application process for this state funding is bureaucratic and laborious. As such the Land Trust has not yet had the personnel capacity or ability to fund surveys and environmental assessments necessary to move forward. The New Haven Coastal Climate Resiliency Project as proposed in this application would allow us to hire a part-time preserve manager and leverage several hundred thousand dollars of State of Connecticut Funding for these acquisitions.

Identified Partners: The Trust for Public Land, City of New Haven.

Evaluation Measures: We will measure success based on additional coastal land acquired. We will increase total acreage by a minimum of several critical coastal acres but expect the increase to be more.

B. Educational Programming:

Background: For years the Land Trust has provided a nominal amount of environmental education to the New Haven public through events and interpretive signage. We are now working to increase our level of programming to broaden the scope of topics covered and the number of individuals participating to include a representative population of individuals and more school-aged children. We are also currently designing new permanent informational signs for several preserves that cover topics spanning from osprey and horseshoe crabs to climate change.

Recently our partnerships in the environmental educational arena have expanded dramatically – in order to reach more participants and share the responsibilities of organizing events, we have cohosted live bird shows with Audubon Connecticut, tidal marsh canoeing expeditions with the Quinnipiac Watershed Association and are partnering with the Yale Peabody Museum to design the interpretive signage. We have commitments from these partners, all of which share an interest in environmental education and climate mitigation, and the environmental education programs outlined in this grant. Partnering organizations generally specialize in a specific area that we are highlighting; for example, Audubon Connecticut is a non-profit organization that focuses on everything related to birds in the state and by cohosting Land Trust events, they are able to reach a wider audience than they would on their own. This expertise augments Land Trust environmental events by including more specific knowledge than the Land Trust could offer alone.

Educational Programming Need: While we have offered limited environmental programming in the past, we have been restricted in our ability to conduct significant outreach to increase the number of participants at our events, and to offer events targeting specific groups. Limited staff time also prevents us from improving the educational experience on our preserves through the installation of more informational signage and kiosks.

The EPA Environmental Justice Grant would allow us to increase the number of events that we offer and the number of people participating in events. By increasing personnel time, we will focus on outreach particularly to local schools and other groups that generally do not interact on our preserves and are in need of more opportunities for exposure to environmental issues. Additionally, the grant will allow us to develop more climate-specific curriculum to share with our visitors and school groups, which would improve the ability of New Haveners to understand issues surrounding climate change.

Identified Partners: Yale Peabody Museum, Audubon Connecticut, Quinnipiac Watershed Association, Menunkatuck Audubon Society.

Evaluation Measures: We will measure success based on the number of educational events held and number of participants. We plan to execute approximately six educational events as a part of the project that will involve 150 participants.

C. Preserve Stewardship

Background: Stewardship of our nature preserves is critical to the success of our environmental efforts. The third and final portion of the project proposal is to implement improved stewardship over the properties to include trail maintenance, additional improved way-finding and interpretive educational signage, invasive species removal, trash cleanup and native tree and shrub planting. While our preserves have highly valuable ecosystem resources, they are constantly facing challenges from invasive species takeover, coastal and interstate litter and deterioration of existing infrastructure that provides an enjoyable educational experience for visitors.

The Land Trust has a strong history of stewardship in our preserves through partnerships with organizations such as the Natural Resources Conservation Service, Audubon Connecticut, New Haven Green Fund, various local schools and organizations to name a few. Recent events include construction of a pedestrian footbridge to improve beach access for high school children, invasive species removal coupled with native tree planting, and trail widening with pea gravel to allow more public access to our preserves.

Preserve Stewardship Need: We are proud to say that our stewardship efforts are very inclusive of and highly reliant on volunteers. That being said, our capacity to oversee and organize volunteer events is limited by staff time to conduct community outreach, purchase materials and oversee volunteer events. The hiring of a preserves manager through an EPA Environmental Justice Small Grant will allow us to have a dedicated staff member to focus on outreach efforts to increase our ability to improve the existing ecosystems on our properties and ensure increased public access and an improved visitor experience to our preserves. While many residents frequent our preserves today, many more do not know the existence of or value of our preserves. With more time dedicated to outreach we will be able to significantly increase the number of volunteer hours on our preserves, the number of individuals engaging with the nature preserves and the impact we will have.

Identified Partners: Yale University Dwight Hall, Audubon Connecticut, The Sound School.

Evaluation Measures: We will measure success based on the number of volunteer events held and number of participants. We plan to execute approximately 10 volunteer events as a part of the project that will involve 200 participants.

V. Organizational Capacity and Programmatic Capacity

With 33 years of existence in the New Haven Community, the Land Trust has a proven track record of an ability to take on the proposal outlined in this application. We have managed projects of similar size in the past as outlined in section VII of this proposal. Additionally, in 2014 we implemented a similar but less ambitious version of this proposal with funding from the Quinnipiac River Fund for educational programming and stewardship projects in our nature preserves.

Should we be awarded the grant, we will immediately begin the hiring process to bring on a preserves manager to begin on the date of project commencement. New Haven is the home of many universities and we have always had success identifying highly qualified applicants for part-time positions. Because in the past we implemented every aspect of the proposed project on a smaller scale, we are confident in our ability to build on these experiences to complete the project. In addition to the preserves manager, our executive director and operations manager will oversee project implementation and completion of grant requirements.

To track and account for expenses we use Xero – a cloud-based accounting program to track all expenditures and ensure our financial obligations are met. We hire an independent accountant to process our 990 and assist with payroll. All financial transactions are monitored separately by the executive director, treasurer, board president and board in monthly financial reports.

VI. Qualifications of the Principal Investigator or Project Manager

Justin Elicker is the executive director of the New Haven Land Trust and will be the project manager. Should the Land Trust be awarded the EPA Environmental Justice Small Grant, Justin will be responsible for overseeing the hiring of the part-time preserve manager, managing that individual and ensuring all goals outlined in the grant application are completed.

Experience: Justin has a Masters in Environmental Management from the Yale School of Forestry and a Masters in Business Administration from the Yale School of Business. During his time at Yale Justin specialized in environmental business, management and policy. Prior to his position as executive director at the New Haven Land Trust, Justin worked at the Yale Office of Sustainability and for several years as a sustainability consultant for numerous companies with national footprints. Justin also served for five years at the United States State Department as a Foreign Service Officer in Washington, D.C., Taiwan and Hong Kong.

Community: Justin has a strong background of community engagement in New Haven. He served as an elected representative to the New Haven Board of Aldermen for four years. During that time Justin was an active advocate for environmental issues. Justin ran for Mayor of New Haven in 2013 and garnered 45% of the vote. During that time Justin spoke with thousands of New Haven residents and gained a deeper understanding of the interests and aspirations of the community. Justin will rely on his experience in the New Haven community to ensure that outreach and educational efforts implemented by the preserve manager are effective.

Climate Change: Justin has relevant experience working in New Haven on climate related issues. He served as the director of the Community Carbon Fund while at the Yale Office of Sustainability and advocated for various environmental and climate change-related initiatives while serving on the New Haven Board of Aldermen including the promotion of a municipal sea level rise action plan.

At the New Haven Land Trust: Justin's management ability has shown in his work. During his first year as executive director, the Land Trust grew substantially, increasing its budget by more than 40%. Justin has also expanded programming including the creation of a Youth Stewards Jobs Corp program and initiation of a rebuild and expansion of many of the Land Trust's community gardens.

VII. Past Performance in Reporting on Outputs and Outcomes

At any one time we are implementing between 10 and 20 government, foundation, and non-profit grants. The grants most comparable in size or scope to this project are listed below:

- New Haven Community Gardens (*$35,000, Community Foundation for Greater New Haven, Denise Canning, 203-777-2386)*: We have filed grant reports each year for the many years of grant support we have received from the Community Foundation for our Community Garden Program. We measure progress by conducting an annual survey of our 46 gardens to gain information on what quantities and types of food are being grown, number of participating gardeners and volunteers, and other relevant data.
- New Haven Community Gardens (*$25,000, City of New Haven, Rebecca Bombero, 203-946-8027)*: We receive annual support from the City of New Haven for our Community Gardening Program. While the City does not require us to submit specific accountings, we internally monitor the expenditures through our accounting software and include data on City expenditures in our Community Foundation grant report.
- Community Garden Infrastructure Improvements *($14,250, State of Connecticut Department of Energy and Environmental Protection, David Stygar, 860-424-3081)*: We have received support from the Connecticut Department of Energy and Environmental Protection to rebuild our community garden infrastructure with raised garden beds, fencing, tool sheds and so on under this multi-year grant. We are required to submit an accounting for each expense for reimbursement in addition to documentation of volunteer hours associated with the project. We have successfully submitted all appropriate paperwork.
- Preserve Restoration - Invasive Removal and Native Tree Planting *($1,407, USDA, NRCS, WHIP Grant, Seth Lerman, 203-287-8038 x 104):* Following each step of the completion of the invasive species removal and native tree planting project, the NRCS conducted a site visit to ensure completion of the grant. Additionally, all paperwork and receipts for the grant work were successfully completed.

VIII. Quality Assurance Project Plan (QAPP) Information

The Land Trust does not foresee that this project will involve the use of existing environmental data or the collection of new data and should not need a QAPP.